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Chiang

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(54) **ELECTRICAL CONNECTOR**

(75) Inventor: **Shu-Man Chiang**, Tu-Cheng (TW)

(73) Assignee: **Cheng Uei Precision Industry Co., Ltd.**, Taipei Hsien (TW)

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H01R 13/648 (2006.01)

(52) **U.S. Cl.** **439/607.35**; 439/607.54

(58) **Field of Classification Search** 439/607.35, 439/607.54, 660, 607.01
See application file for complete search history.

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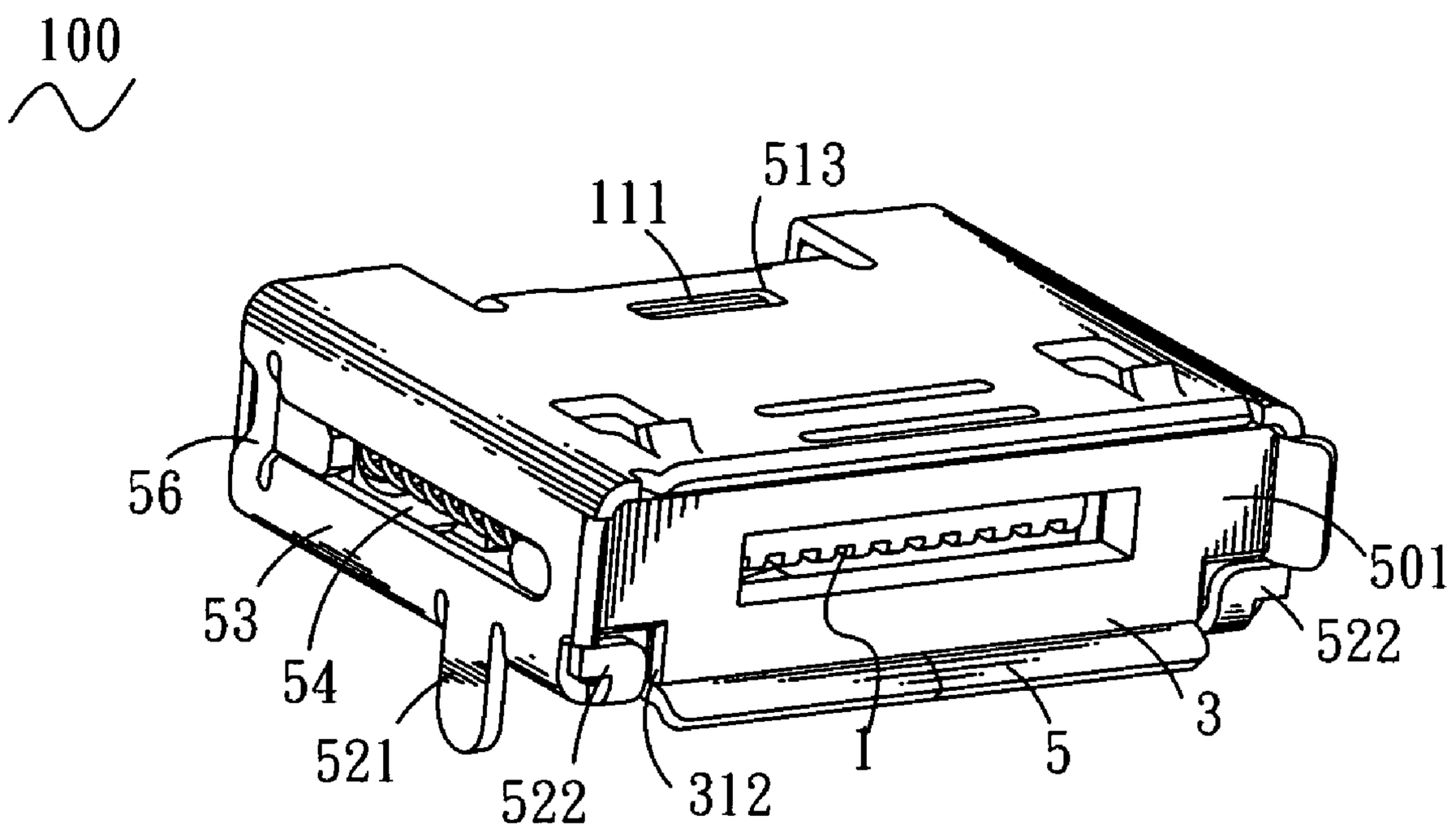
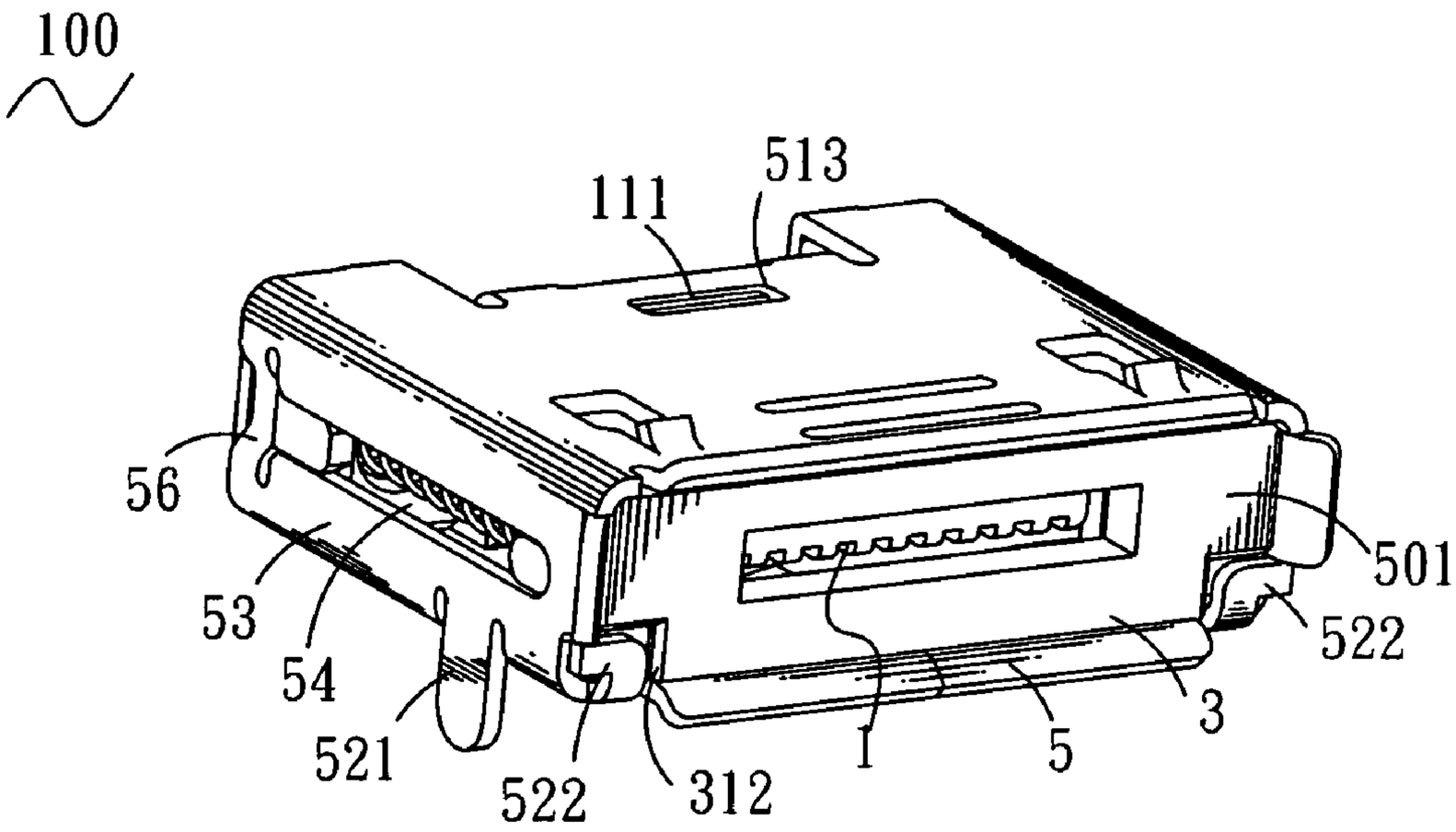
Primary Examiner—Gary F. Paumen
(74) *Attorney, Agent, or Firm*—Rosenberg, Klein & Lee

(57) **ABSTRACT**

An electrical connector includes a dielectric housing, a plurality of terminals and a shield. The dielectric housing defines a plurality of terminal grooves therein for receiving the terminals. At least one recess is formed in an outer surface of the dielectric housing. The shield has a plurality of sidewalls to define a receiving space therebetween for receiving the dielectric housing therein. At least one of the sidewalls is punched inward at a portion corresponding to the recess of the dielectric housing to form a retaining portion restricted in the recess after the dielectric housing is mounted in the receiving space. The retaining portion is restricted in the recess for fixing the dielectric housing inside the shield. The depth of the recess and the retaining portion restricted in the recess is not limited by the depth of the material of the shield. The dielectric housing is fixed in the shield firmly.

9 Claims, 5 Drawing Sheets

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111
513
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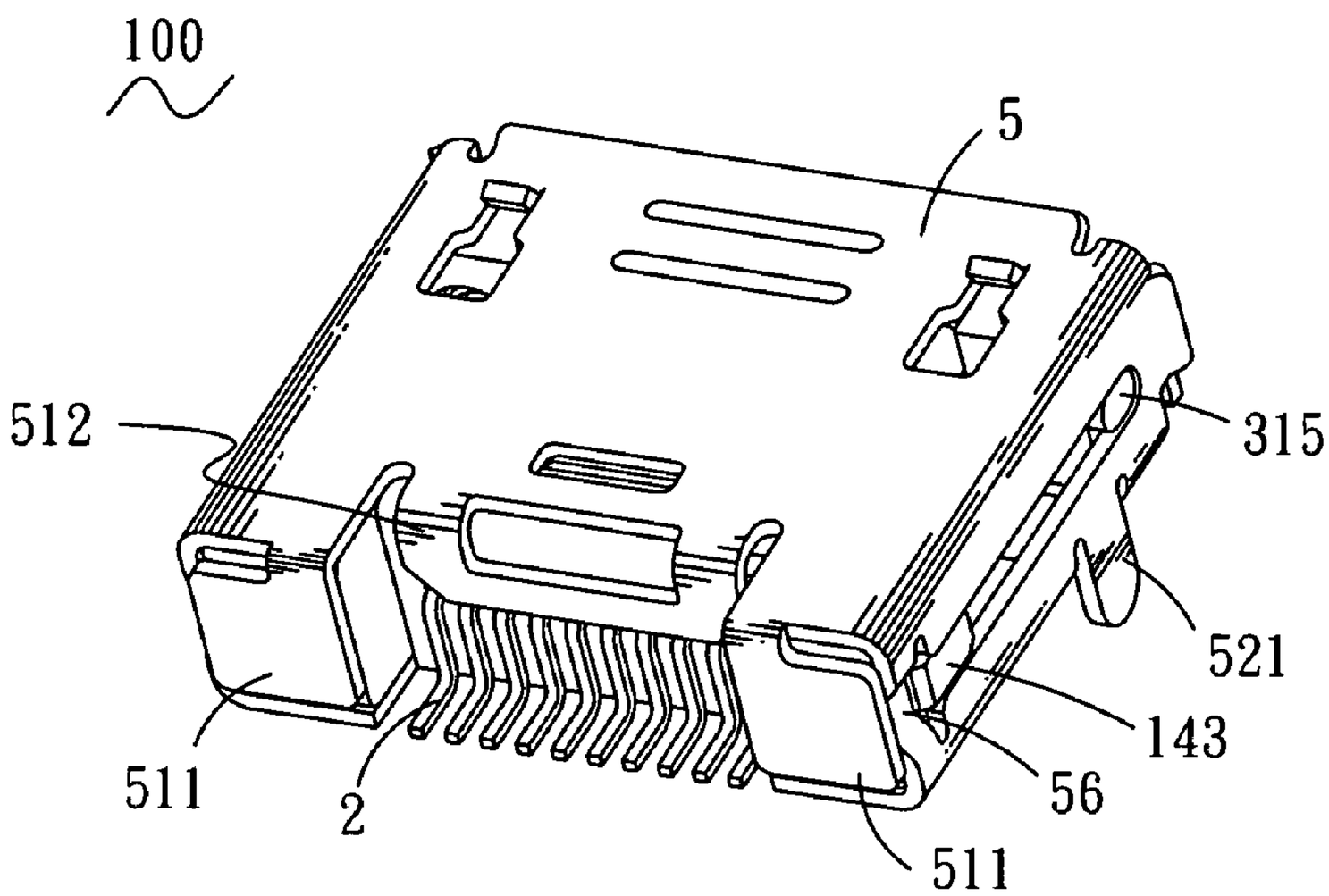
53
54
521
522
312
1
5
3
501
522

FIG. 1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521
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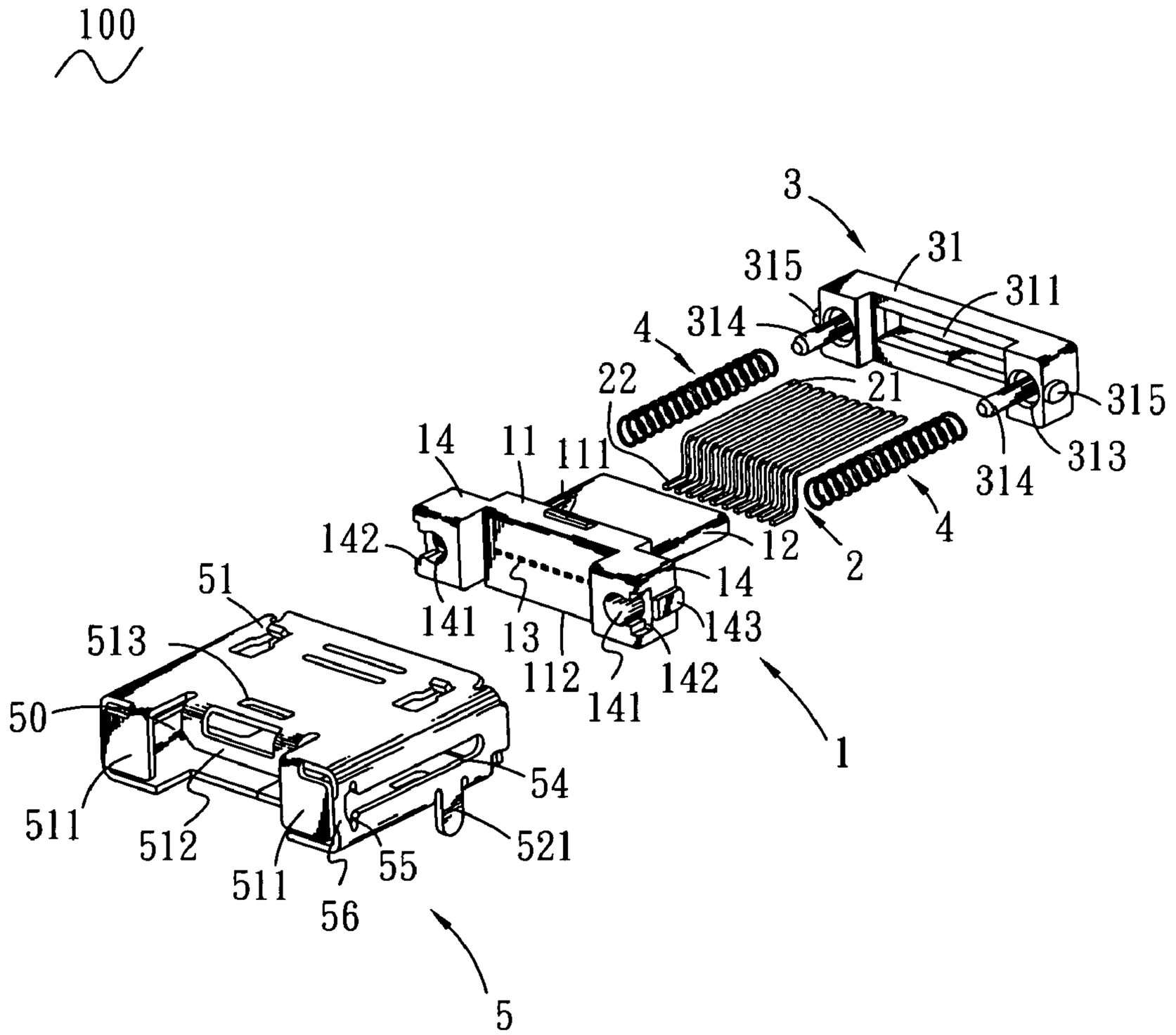
2
511

FIG. 2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2
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55
56
5

FIG. 3

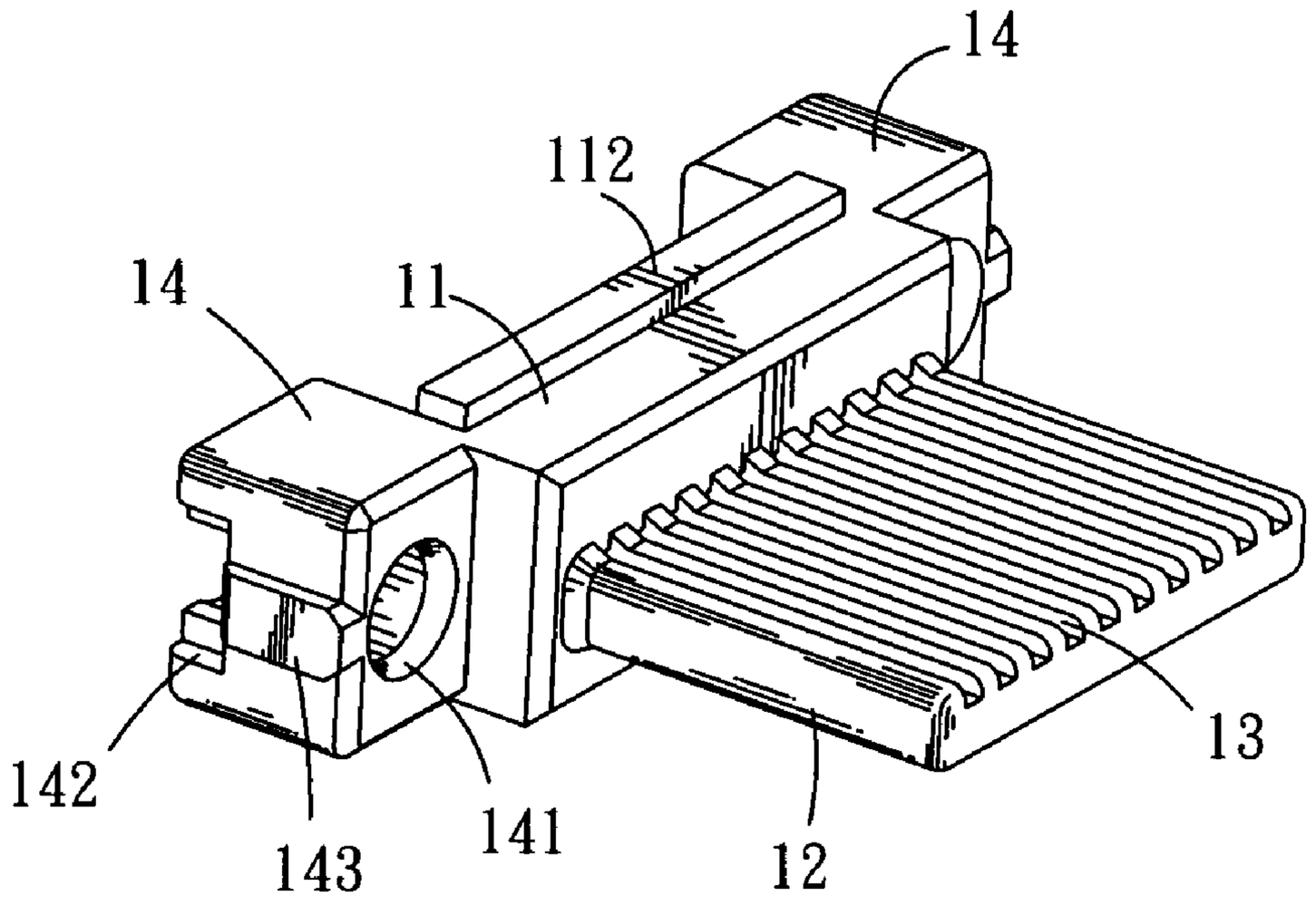

FIG. 4

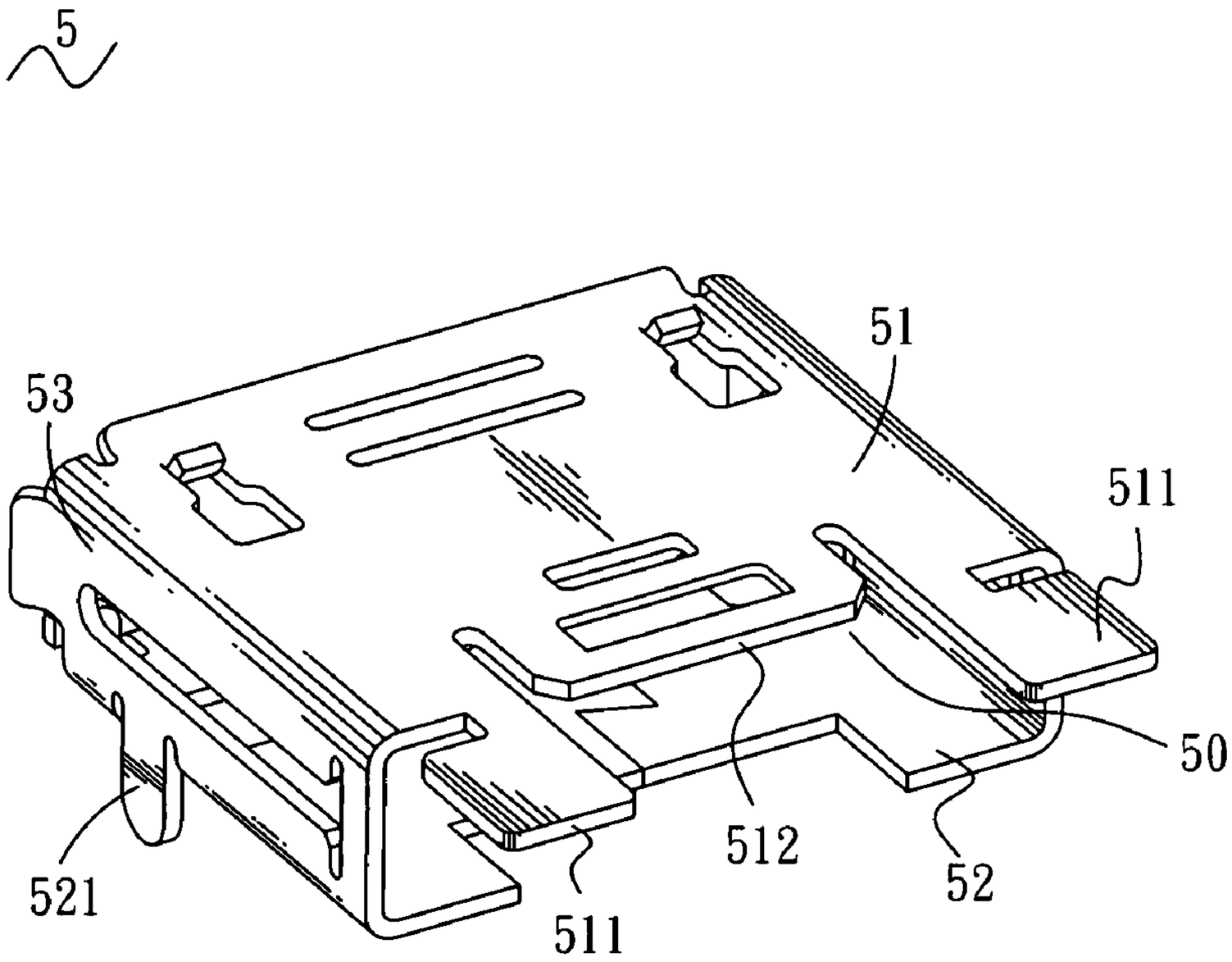

FIG. 5

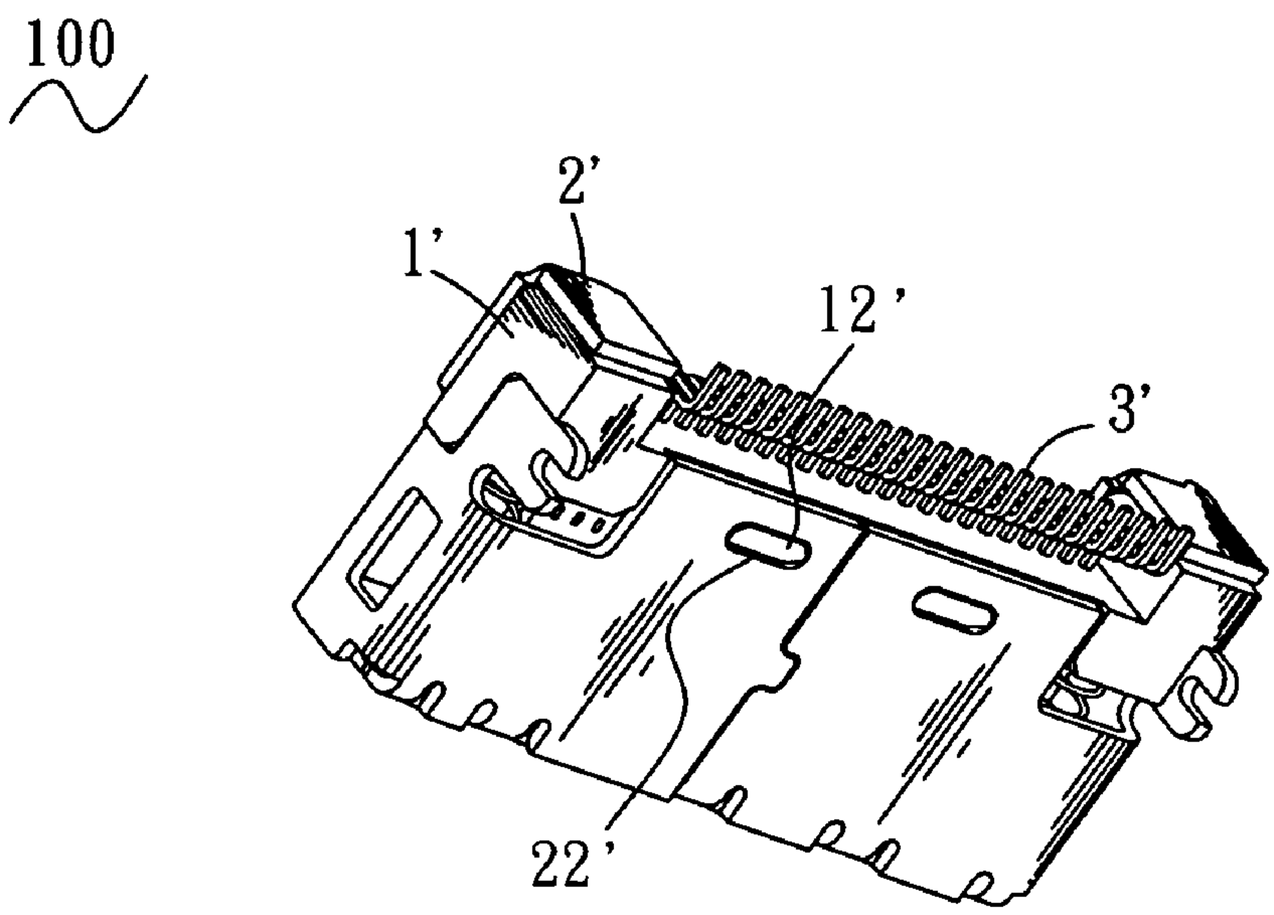

FIG. 6

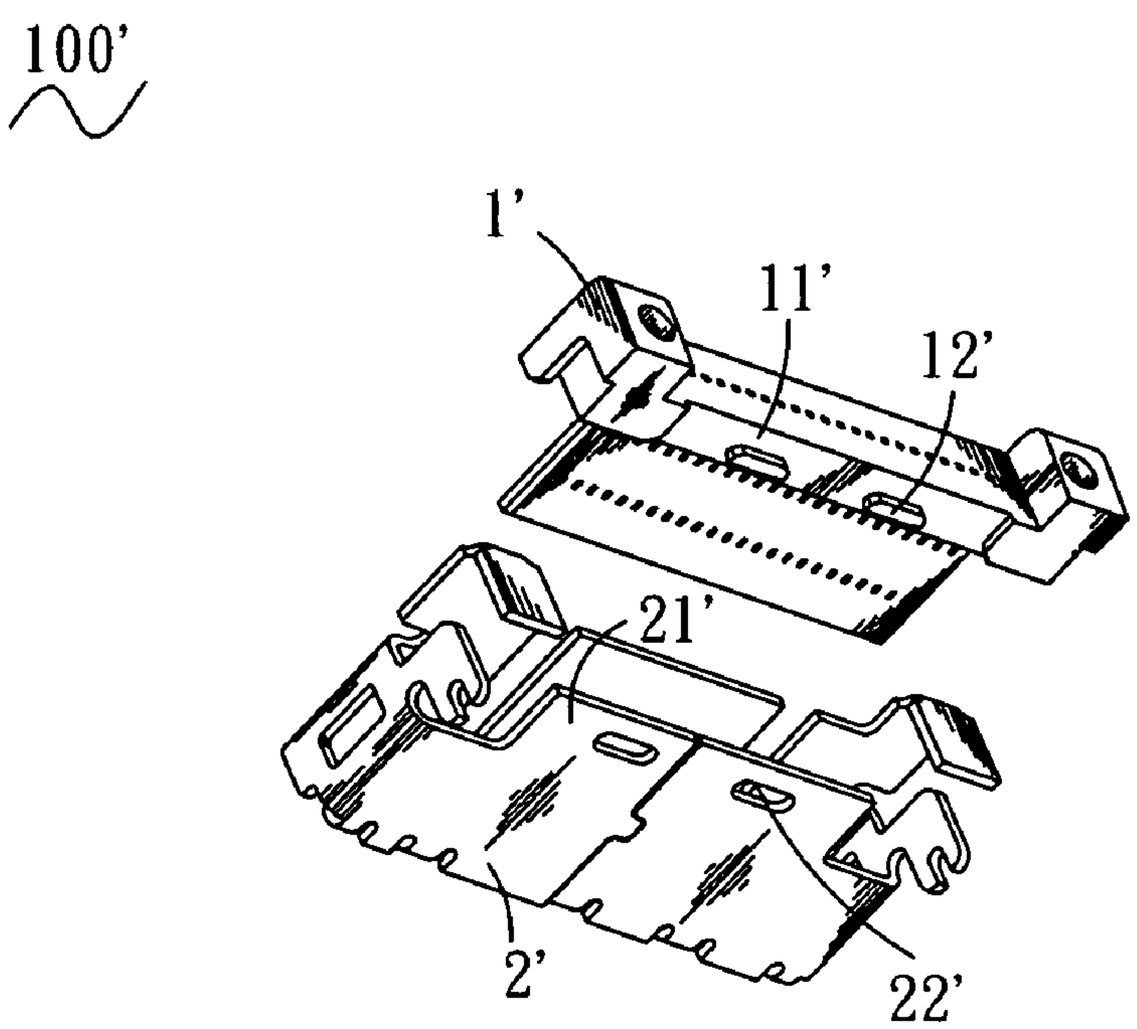

FIG. 7

ELECTRICAL CONNECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a connector, and more particularly to an electrical connector.

2. The Related Art

Please refer to FIGS. **6** and **7**, a conventional electrical connector **100'** is shown. The electrical connector **100'** includes a dielectric housing **1'**, a shield **2'** surrounding the dielectric housing **1'** and a plurality of terminals **3'** received in the dielectric housing **1'**. The dielectric housing **1'** defines a groove **11'** therein the depth of which is substantially equal to the depth of the material of the shield **2'**. Two projections **12'** are protruded from a bottom surface of the groove **11'**. The height of the projection **12'** is substantially equal to the depth of the groove **11'**. The shield **2'** has a board **21'** received in the groove **11'** of the dielectric housing **1'**. Two apertures **22'** are formed in the board **21'** of the shield **2'**. The two projections **12'** of the dielectric housing **1'** are respectively received in the apertures **22'** of the shield **2'** for fixing the dielectric housing **1'** in the shield **2'**.

However, the specification of the electrical connector **100'** is demanded to be made more and more small, the depth of the shield **2'** and the groove **11'**, and the height of the projections **12'** need to be as thin as possible. When a complementary connector is inserted into the electrical connector **100'**, a push force will be transferred to the dielectric housing **1'**, which makes the projections **12'** easy to be out of the apertures **22'**. The electrical connection between the electrical connector **100'** and the complement connector will be unsteady.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an electrical connector. The electrical connector includes a dielectric housing, a plurality of terminals and a shield. The dielectric housing defines a plurality of terminal grooves therein for receiving the terminals. At least one recess is formed in an outer surface of the dielectric housing. The shield has a plurality of sidewalls to define a receiving space therebetween for receiving the dielectric housing therein. At least one of the sidewalls is punched inward at a portion corresponding to the recess of the dielectric housing to form a retaining portion restricted in the recess after the dielectric housing is mounted in the receiving space of the shield.

As described above, after the dielectric housing is mounted in the shield, the retaining portion of the shield is punched to be restricted in the recess formed in the dielectric housing, the depth of the recess and the retaining portion restricted in the recess is not limited by the depth of the material of the shield. The dielectric housing is fixed in the shield firmly.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be apparent to those skilled in the art by reading the following description of a preferred embodiment thereof, with reference to the attached drawings, in which:

FIG. **1** is a perspective view of an electrical connector according to the present invention;

FIG. **2** is another perspective view of the electrical connector shown in FIG. **1**;

FIG. **3** is an exploded view of the electrical connector shown in FIG. **1**;

FIG. **4** is a perspective view of a dielectric housing of the electrical connector shown in FIG. **1**;

FIG. **5** is a perspective view of a shield of the electrical connector shown in FIG. **1** before being assembled;

FIG. **6** is a perspective view of a conventional electrical connector; and

FIG. **7** is a perspective view of a dielectric housing apart from a shield of the conventional electrical connector.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIGS. **1-3**, an electrical connector **100** according to the present invention includes a dielectric housing **1**, a plurality of terminals **2** received in the dielectric housing **1**, a dustproof cover **3**, two coils of springs **4**, and a shield **5**.

Please refer to FIGS. **1**, **3** and **4**, the dielectric housing **1** has a substantially rectangular basic portion **11**. The middle of a rear surface of the basic portion **11** extends rearward to form an extending board **12**. A plurality of terminal grooves **13** is abreast formed in the basic portion **11** and a bottom surface of the extending board **12** and extends from a front surface of the basic portion **11** to a rear end of the extending board **12**. A first bump **111** is protruded upward from a top surface of the basic portion **11**. An elongated second bump **112** is protruded downward from a bottom surface of the basic portion **11**. Two rectangular lumps **14** respectively extend outward from two ends of the basic portion **11**. Each of the lumps **14** defines a hole **141** extending from a front surface of the lump **14** to a rear surface thereof. A rectangular recess **142** is formed in the junction of the front surface and an outer surface of each of the lumps **14**. The two recesses **142** respectively communicate with the corresponding holes **141**. A pair of projections **143** respectively protrude outward from the outer surface of the two lumps **14**.

With reference to FIG. **3**, each of the terminals **2** includes a contact portion **21** and a soldering portion **22** bending and extending from a front end of the contact portion **21**. The contact portion **21** is received in the terminal groove **13** and the soldering portion **22** extends out of the dielectric housing **1**.

Please refer to FIGS. **1** and **3**, the dustproof cover **3** of a substantially rectangular shape has a main body **31**. An elongated rectangular slot **311** is formed in the middle of the main body **31** and extends from a front surface to a rear surface. Two cuts **312** are respectively formed in two ends of the bottom of the rear surface of the main body **31**. Two cylindrical openings **313** are respectively formed in two ends of the front surface of the main body **31**. A bottom of each opening **313** extends forward to form a rod **314** which extends out of the main body **31**. A pair of oval-shaped guiding portions **315** is respectively protruded outward from two outsides of the main body **31**.

Please refer to FIGS. **1**, **3** and **5**, the shield **5** includes a top board **51**, a bottom board **52** opposite to the top board **51**, and two sideboards **53** connected to the two sides of the top board **51** and the bottom board **52**. A receiving space **50** is surrounded by the top board **51**, the bottom board **52** and the sideboards **53**. A rear end of the shield **5** defines an inserting mouth **501** for allowing a complement connector (not shown) inserting into the receiving space **50** therefrom. Two ends of a front end of the top board **51** extend forward abreast to form two retaining pieces **511**. The middle of the front end of the top board **51** is cut to form a tab **512** between the two retaining pieces **511**. An aperture **513** is formed in the top board **51** behind the tab **512**. Two elongated sliding grooves **54** are

symmetrical respectively formed in the two sideboards **53**. A slit **55** is formed in a front end of each of the sliding groove **54**. The slit **55** communicates with the sliding groove **54** and is perpendicular to the sliding groove **54**. The middle of the junctions of the bottom board **52** and the two sideboards **53** extend downward to form a pair of fixing pieces **521**. The fixing pieces **521** extend out of the shield **5** and are inserted into a printed circuit board (not shown) to fix the electrical connector **100** on the printed circuit board. Two hooks **522** extend and bend upward from a rear end of the bottom board **52** adjacent to the two sideboards **53**.

Please refer to FIGS. **1** and **2**, in assembly, firstly, the dustproof cover **3** is inserted into the shield **5** through the front end of the shield **5** until the dustproof cover **3** is restricted by the hooks **522** of the shield **5**. More specially, the two guiding portions **315** are respectively inserted into the two sliding grooves **54** and then slide rearward along the sliding grooves **54**. Secondly, the dielectric housing **1** assembled with the terminals **2** is inserted into the shield **5** through the front end of the shield **5**. The rear end of the extending board **12** of the dielectric housing **1** is inserted into the slot **311** of the dustproof cover **3**. The two projections **143** are respectively received in the sliding grooves **54**. The first bump **111** is inserted into the aperture **513** of the shield **5**. The second bump **112** is restricted by the front end of the bottom board **52** of the shield **5**. Thirdly, one end of each of the springs **4** passes through the hole **141** of the dielectric housing **1**, and then the end of the spring **4** is received in the opening **313** and surrounds the rod **314** of the dustproof cover **3**. The opposite end of each of the springs **4** is received in the hole **141** of the dielectric housing **1**. At last, the two retaining pieces **511** of the shield **5** are respectively bent downward to cover the two holes **141** and restrict the springs **4** in the holes **141**. The tab **512** is bent downward to be attached to the front end of the dielectric housing **1**. The part of each of the sideboards **53** between a front side of the sideboard **53** and the slit **55** is respectively punched inward to form a retaining portion **56** which is restricted in the corresponding recesses **142** of the dielectric housing **1**.

As described above, after the dielectric housing **1** is mounted in the shield **5**, the retaining portions **56** of the shield **5** are punched to be restricted in the recesses **142** formed in the dielectric housing **1**, the depth of the recesses **142** and the retaining portions **56** restricted in the recesses **142** is not limited by the depth of the material of the shield **5**. The dielectric housing **1** is fixed in the shield **5** firmly. When the electrical connector **100** engages with the complementary connector, the dielectric housing **1** avoids removing from the shield **5** even the dielectric housing **1** is suffered by a push force.

The foregoing description of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and obviously many modifications and variations are possible in light of the above teaching. Such modifications and variations that may be apparent to those skilled in the art are intended to be included within the scope of this invention as defined by the accompanying claims.

What is claimed is:

1. An electrical connector, comprising:

a dielectric housing defining a plurality of terminal grooves therein, at least one recess being formed in an outer surface of the dielectric housing;

a plurality of terminals received in the terminal grooves of the dielectric housing; and

a shield having a plurality of sidewalls defining a receiving space therebetween for receiving the dielectric housing therein, at least one of the sidewalls being punched inward at a portion corresponding to the recess of the dielectric housing to form a retaining portion received in the recess after the dielectric housing is mounted in the receiving space, the at least one sidewall defining a slit spaced from and adjacent to one end of the sidewall to make the retaining portion being punchingly formed therebetween facilely.

2. The electrical connector as claimed in claim **1**, wherein the retaining portion is respectively formed at substantially symmetrical portions of the two opposite sidewalls for being restricted in the recess respectively defined in two opposite surfaces of the dielectric housing.

3. The electrical connector as claimed in claim **1**, wherein the dielectric housing is inserted into the receiving space of the shield from an end of the shield adjacent to the slit, an opposite end of the shield defines an insertion mouth for allowing insertion of a complementary connector.

4. The electrical connector as claimed in claim **1**, wherein the retaining portion is respectively formed at the two opposite sidewalls for being received in the recess respectively defined in two opposite surfaces of the dielectric housing.

5. The electrical connector as claimed in claim **4**, wherein the sidewalls respectively define a sliding groove extending along an insertion direction of the dielectric housing and communicating with and being substantially perpendicular to the corresponding slit.

6. The electrical connector as claimed in claim **5**, further comprising a dustproof cover received in the receiving space of the shield, two sides of the dustproof cover protruded outward to form two guiding portions respectively arranged in the two sliding grooves of the shield.

7. The electrical connector as claimed in claim **1**, wherein the shield has a top board, a middle of one end of the top board is cut to form a tab, after the dielectric housing is mounted in the shield, the tab is bent downward to be attached to the dielectric housing.

8. An electrical connector, comprising:

a dielectric housing defining a plurality of terminal grooves therein, at least one recess being formed in an outer surface of the dielectric housing;

a plurality of terminals received in the terminal grooves of the dielectric housing; and

a shield having a plurality of sidewalls defining a receiving space therebetween for receiving the dielectric housing therein, at least one of the sidewalls being punched inward at a portion corresponding to the recess of the dielectric housing to form a retaining portion received in the recess after the dielectric housing is mounted in the receiving space, the shield having a top board, a middle of one end of the top board being cut to form a tab, wherein after the dielectric housing is mounted in the shield, the tab is bent downward to be attached to the dielectric housing.

9. The electrical connector as claimed in claim **8**, wherein the retaining portions is respectively formed at substantially symmetrical portions of the two opposite sidewalls for being received in the recess respectively defined in two opposite surfaces of the dielectric housing.

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